METHOD FOR RECEIVING AND DISCHARGING BARS IN ROLLING MILL PLANTS

VERFAHREN ZUM AUFNEHMEN UND ABGEBEN VON STÄBEN IN WALZWERKSANLAGEN

PROCEDE POUR RECEVOIR ET DECHARGER DES BARRES DANS DES INSTALLATIONS DE LAMINAGE

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References cited:
IT-B-1 127 813
IT-B-1 225 986
US-A-4 054 047

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Description

Technical Field

[0001] This invention has for object a method for receiving and discharging bars and device with couple of adjacent parallel rotating drums for receiving bars in longitudinal advancement and discharging them by fall on underlying cooling bed in rolling mill plants.

Background Art

[0002] The speed presently used in the steel bars hot-rolling plants is of about 35 m/sec.
[0003] Such speed is difficult to be increased.
[0004] The main cause is in the stand-off forced by the receiving of the rolling bars downstream of a well known "flying shear machine", that breaks the continuous rolled section deviating it by sending a bar on one side and a bar on the other in a known channelled rotating drums having four externally open channels on each drum, that by receiving a bar in a drum and a bar in the other, provide alternatively to discharge them downwards after rotation on the underlying cooling bed.

[0005] Increasing such speed on this device which works very well and is reliable, resulted up to now practically impossible because there is not enough time for making rotate the drum to move the respective receiving channel from receiving position to a discharge position, discharging the bar and use again the same channel, rotating it in the receiving position, for receiving the following bar.

[0006] Attempts for increasing the speed were made, but presently it was found only a solution for forwarding and discharging two bars together (SPLIT art).

[0007] This art is well described in the Italian patent in the name of the same applicant having the filing number IT-83489A/88.

[0008] This solution however obliges to discharge two bars at a time on the underlying cooling bed with risk of lotting, additionally said art is complex requiring the crossed forwarding of the two drums to the channels.

Purpose of the present invention

[0009] Purpose of the present invention is that of increasing the speed of said device without need of substantially changing its structure.

Essence of the invention

[0010] The problem is solved as claimed by a method for receiving and discharging bars and device with couple of adjacent parallel rotating drums for receiving bars in longitudinal advancement and discharging them by fall on underlying cooling bed in rolling mill plants, in which each drum is provided with four opposite channels rotating in couples.

characterised in that the system is contrived for operating at least as follows:

- at first sending two bars in logic succession on two adjacent channels of a drum and,
- then sending other two bars in logic succession in two adjacent channels of the adjacent drum, and
- while a drum receives a couple of bars, the other rotates for discharging the couple of received bars. Advantageously the discharge occurs in two progressive steps:
  - rotating a drum of a certain angle for allowing the discharge of a first bar and then,
  - further rotating the drum to allow the discharging of the second bar.

[0011] Thus it is possible by using each drum, discharging a bar at a time on the respective cooling bed underlying seat that in accordance, will shift transversely the different bars.

[0012] Thus tangling risks can be avoided and the speed can be considerably increased.

[0013] The advantages are immediate, considering that by this solution it is possible increasing the advancing speed of the whole rolling mill plant from 35 Mt./sec. up to 50/60 Mt./sec., reducing the accelerations and decelerations inertia times and dead times between a phase and the other having a movement of the drum for each two received bars rather than a movement for one received bar.

[0014] These and other advantages will appear from the following description of a preferred solution, with the aid of the included drawings, whose details are not to be considered as limitative but only supplied as an example.

[0015] Figure 1 is a simplified cross sectional view, on the vertical-plane of a device with a double drum device according to the present invention where by 1,2,3,4 are indicated the positions of progressive forwarding of four bars in logic succession in the respective couples of channels in the two drums.

[0016] Figure 2 is a view of the phases in logic succession (A,B,C,B) showing how the bars are received and discharged according to the present invention.

[0017] According to the figures, by 5 is indicated the device with two drums according to the present invention and by 6 the underlying cooling bed that horizontally and transversally translates the bars, after they have been braked in their longitudinal advancement within the respective channels (520) of each drum (52).

[0018] Each drum as in prior art is mounted on rotating axis (51) with head motor (not shown) for its rotation for angular predetermined values.

[0019] Each drum (52) is internally covered by a crankcase (53) that prevents the bars (1,2,3,4) from coming out, making their downwards fall, only after suitable drum rotation.
According to the invention the bars are sent in succession into the channels 1, 2, 3 and 4 later starting again from channel 1.

This means that we are sending two subsequent bars for each drum instead of one bar for each drum as it presently happens.

This allows having at disposal a double time respect to the one existing now, in order to be able to make the respective drum rotate of 180° in place of 90° prior art (cross disposition of the 4 channels).

In order to avoid discharging two bars for each tooth of the cooling bed, the concerned drum stops for a suitable time, in an intermediate angular position for example at 100° (Phase A Fig.2). Thus it is possible discharging the bar n. 2 and retaining the bar n. 1 in order to allow the plate (discharging and cooling bed) to make the bar n. 2 advance on the 2° opening of the same, by freeing the 1° opening for receiving the 1° bar.

This type of solution allows also to receive simultaneously two bars coming from “SPLIT” rolling or from a double wired rolling mill as in IT-A-83489A/88.

It must additionally be considered that at the entry of the new system n. 4 bar-brakers are obviously necessary, as for the IT-A-83489A/88.

The machine can also receive only one bar for drum (in the case of large rod sections with lower speed), in this case only one channel for drum and only two bar-brakers will be used.

All is valid also in case the drums rotate outside instead that inside.

The subsequent phases for four bars according to the present invention, are clearly explained by Figure 2.

Obviously in the solution, four channels for each drum are preferentially shown but they could be also of greater number.

Advantageously, as per the figures the respective couple of channels 1, 2-520 are disposed in two couples one opposed to the other in each drum 52.

Patentansprüche

1. Verfahren zur Aufnahme und Abladung von Stäben unter Verwendung von rotierenden Kanälen mit einer Vorrichtung mit einem Paar nebeneinanderliegender paralleler rotierender Trommeln zur Aufnahme von der Länge nach vorrückenden Stäben und ihrer Abladung durch Fallen auf ein darunterliegendes Kühlbett, in Walzwerksanlagen, wobei jede Trommel mit mindestens vier Kanälen ausgestattet ist, die in mindestens zwei gegenüberliegenden Paaren rotieren, wobei jede Trommel mit vier Stabaufnahmekanälen ausgestattet ist (5), durch die folgenden Schritte gekennzeichnet:

- zuerst Beförderung zweier aufeinanderfolgender Stäbe i n logischer Abfolge (3-A; 4-B) auf die oberen zwei anliegenden Kanäle einer Trommel und,
- dann Beförderung zweier weiterer aufeinanderfolgender Stäbe i n logischer Abfolge (5-C; 6-D) in die oberen zwei anliegenden Kanäle der anliegenden Trommel, und
- während eine Trommel die besagten Stäbe empfängt, rotiert die andere Trommel, um die schon empfangenen Stäbe abzuladen, u m nur ein Stabpaar auf einmal auf das darunterliegende Kühlbett abzuladen, wobei besagtes Verfahren weiter dadurch gekennzeichnet ist, dass das Abladen der Stabpaare in zwei aufeinanderfolgenden Schritten geschieht:
  - Rotieren bis zu einem bestimmten Winkel zwecks Abladung eines ersten Stabs des Paars (2-A) und dann,
  - Weiterrotieren, um die Abladung des zweiten Stabs des Paars zu erlauben (1-B).
Revendications

1. Méthode pour la réception et le déchargement de barres en utilisant des canaux rotatifs en utilisant un dispositif avec une paire de tambours parallèles adjacents rotatifs pour la réception de barres en avancement longitudinal et pour les décharger en les faisant tomber sur un lit refroidisseur situé en dessous, dans les laminoirs. Chaque tambour étant muni d'au moins quatre canaux qui tournent dans au moins deux couples opposés, chaque tambour étant muni de quatre canaux de réception de barres (5), caractérisé par les étapes suivantes:

- au début l'envoi de deux barres consécutives en succession logique (3-A; 4-B) sur les deux canaux supérieurs adjacents d'un tambour et.
- puis l'envoi d'autres deux barres consécutives en succession logique (5-C; 6-D) dans les deux canaux supérieurs adjacents du tambour adjacent, et
- tandis qu'un tambour reçoit ladite barre, l'autre tambour tourne pour décharger la barre déjà reçue afin de décharger seulement une paire de barre en même temps sur le lit refroidisseur situé en dessous, ladite méthode étant en outre caractérisée en ce que le déchargement de couples de barres se vérifie dans deux étapes progressives:
  - rotation d'un certain angle pour permettre le déchargement d'une première barre du couple (2-A) et puis,
  - une ultérieure rotation pour permettre le déchargement de la seconde barre du couple (1-B).
FIG. 2